

### AMENDMENTS TO THE CLAIMS

Please cancel claims 4, 6, 7, and 10 and amend claims 1, 5, and 11 as set forth below.

1. (Currently Amended) A corneal surgery apparatus for ablating a cornea of a patient's eye by irradiation of a laser beam, the apparatus comprising:
  - an irradiation optical system for irradiating the laser beam onto the cornea;
  - image-pickup means for picking up an image of an anterior segment of the eye in a condition where the laser beam is irradiated;
  - characteristic point detection means for detecting characteristic points common to a first anterior-segment image of the eye picked up in a condition where measurement data for determining corneal ablation data of the eye is obtained and a second anterior-segment image of the eye picked up by the image-pickup means before ablation of the cornea, the second anterior-segment image including images of marks for torsion-detection provided for outside an ablation area of the eye;
  - mark detection means for detecting the mark images in the second anterior-segment image;
  - ~~first~~ torsion-detection means for obtaining a ~~first~~ torsion-error angle of ~~the second anterior segment image with respect to the first anterior segment image based on the characteristic points in the first and second anterior segment images the eye; and~~
  - ~~first~~ torsion-correction means for correcting the ~~first obtained~~ torsion-error angle before the ablation of the cornea;
  - ~~mark detection means for detecting the mark images common to the second anterior-segment image and a third anterior-segment image of the eye picked up by the image-pickup means during the ablation of the cornea, the third anterior-segment image including the mark images;~~
  - wherein the torsion-detection means obtains, based on the characteristic points in the first anterior-segment image and the characteristic points in the second anterior-segment image picked up before corneal ablation, the torsion-error angle that occurred before the corneal ablation,
  - the torsion-correction means performs any one of rotation of a patient's head and correction of control data on the irradiation optical system so as to correct the torsion-error angle that occurred before the corneal ablation,

second the torsion-detection means for obtaining a second obtains, based on the mark images in the second anterior-segment image after correction of the torsion-error angle before the corneal ablation and the mark images in the second anterior- segment image picked up during the corneal ablation, the torsion- error angle of the third anterior-segment image with respect to the second anterior-segment image that occurred during the corneal ablation based on the mark images in the second and third anterior-segment images; and

second the torsion-correction means for correcting performs any one of stop of the irradiation of the laser beam and correction of the control data on the irradiation optical system so as to correct the second torsion-error angle that occurred during the corneal ablation of the cornea.

Claims 2-4 are (CANCELED)

5. (CURRENTLY AMENDED) The corneal surgery apparatus according to claim 1, further comprising display means for displaying the first and second anterior-segment images, wherein the characteristic-points point detection means includes designation means for designating the characteristic points based on the displayed images.

Claims 6-10 are (CANCELED)

11. (CURRENTLY AMENDED) A corneal surgery apparatus for ablating a cornea of a patient's eye by irradiation of a laser beam, the apparatus comprising:

an irradiation optical system for irradiating the laser beam onto the cornea;  
an image-pickup unit which picks up an image of an anterior- segment of the eye in a condition where the laser beam is irradiated;

a characteristic point detection unit which detects characteristic points common to a first anterior-segment image of the eye picked up in a condition where measurement data for determining corneal ablation data of the eye is obtained and a second anterior-segment image of the eye picked up by the image- pickup unit before ablation of the cornea, the second anterior-segment image including images of marks for torsion-detection provided for outside an ablation area of the eye;

a mark detection unit which detects the mark images in the second anterior- segment image;

~~a first torsion-detection unit which obtains a first torsion-error angle of the second anterior segment image with respect to the first anterior segment image based on the characteristic points in the first and second anterior segment images the eye; and~~

~~a first torsion-correction unit which corrects the first obtained torsion-error angle before the ablation of the cornea;~~

~~a mark detection unit which detects the mark images common to the second anterior segment image and a third anterior segment image of the eye picked up by the image pickup unit during the ablation of the cornea, the third anterior segment image including the mark images;~~

wherein the torsion-detection unit obtains, based on the characteristic points in the first anterior-segment image and the characteristic points in the second anterior-segment image picked up before corneal ablation, the torsion-error angle that occurred before the corneal ablation,

the torsion-correction unit performs any one of rotation of a patient's head and correction of control data on the irradiation optical system so as to correct the torsion-error angle that occurred before the corneal ablation,

~~a second the torsion-detection unit which obtains, based on the mark images in the second anterior-segment image after correction of the torsion-error angle before the corneal ablation and the mark images in the second anterior-segment image picked up during the corneal ablation, a second the torsion-error angle of the third anterior segment image with respect to the second anterior segment image that occurred during the corneal ablation based on the mark images in the second and third anterior segment images; and~~

~~a second the torsion-correction unit which corrects performs any one of stop of the irradiation of the laser beam and correction of the control data on the irradiation optical system so as to correct the second torsion-error angle that occurred during the corneal ablation of the cornea.~~

12. (CANCELED)